

## On the Genus *Felisacus* Distant (Heteroptera; Miridae; Bryocorinae)

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THE GENUS *FELISACUS* Distant includes 16 species of elongate, transparent winged bugs of the subfamily Bryocorinae, with a mainly tropical and subtropical distribution in the Western Pacific and Indian Ocean areas. Species are recorded from Madagascar, Seychelles, Ceylon, Burma, Malaya, Formosa, Philippines, Guam, Borneo, Java, Amboina, New Guinea, Australia, New Zealand, Fiji, and Samoa. In the course of this paper a division of the genus into two or possibly three species-groups or subgenera is discussed. One of these groups is mainly northern Pacific in distribution (S.E. Oriental region), the second mainly southern Pacific (apparently centred on the Australasian region), while the third (and tentative) group borders mainly the Indian Ocean.

The only host plants recorded for species of this genus are ferns, and all the evidence indicates a preference for and probable restriction to ferns as food plants of these bugs. Extensive sweeping over a period of several years in New Zealand has yielded no specimens of *F. elegantulus* from any other plants but low-growing, bracken-like ferns, and then only in rather damp, stream-side localities shaded by trees, where a large series, including nymphs as well as adults, has been collected in a very limited area. This last preference may perhaps be correlated with a tropical origin of the genus in regions where the characteristic vegetation cover is rain-forest. The whole subfamily Bryocorinae, indeed, is dis-

tributed preponderantly, though not exclusively, in the wet tropics and is represented most strongly in Central and South America.

The fern-frequenting habit of numbers of species belonging to other genera of Bryocorinae is well known and probably applies also to a good proportion of the species for which no host records are yet available. The habit seems commonest in the tribe Bryocorini, members of the tribes Odoniellini and Monaloniini apparently having a very diversified host range. By no means all Bryocorini are fern-dwellers, but the tribe as a whole does show an unusual preference for ferns, which seem from the records to be neglected by most other mirids. The Bryocorinae are generally regarded as a morphologically rather primitive mirid group and, while the preference of many of them for a relatively archaic group of plants may be coincidental, there is the possibility of its being a retained preference. This, of course, touches on highly hypothetical ground, but the host preference of insects is an interesting and fundamental, if still at present rather obscure, problem, and it seems to the writer that this case suggests some possibilities that are susceptible of test. Useful evidence might be accumulated by the identification, wherever possible, of the host plants of *Felisacus* and of other genera of Bryocorinae. It would be interesting, for example, to see whether there is any general phylogenetic correlation between the species and genera of Bryocorinae and the genera or families of plants on which they feed, or whether the preference for ferns, where it exists, extends no further than the nature of

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the food and other products of metabolism of ferns as contrasted with those of higher plants.

There is what appears to be a somewhat analogous case among the Hemiptera in the archaic homopteran family of Peloridiidae, which require a substratum of continuously moist mosses or lichens. In this instance both the general type of host plant and the associated high humidity seem to be necessary. It might be possible to test to what extent the host preference of any particular species of Bryocorinae is due to a dependence on the host plant itself or upon the habitat conditions in which the host normally lives. Such preference may be related not only to food needs but also to requirements of oviposition. The writer has seen no reference to the oviposition habits of those Bryocorinae living on ferns, but from what is known of their life histories it would seem likely that they insert their eggs in the food plant.

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imens of *F. elegantulus* (Reuter) from Nelson; and Mr. J. R. Henry, Keeper of the Macleay Collection, University of Sydney, Mr. J. M. Letchford, of Brisbane, and Mr. F. A. Perkins, Head of the Department of Entomology, University of Queensland, for the gift or loan of Australian specimens of the latter species. For the kind provision of transport and other assistance in collecting material I am indebted to Dr. E. J. Reye, Brisbane, Queensland, and Dr. R. A. Cumber, of the Entomological Research Station, Nelson, New Zealand; and for the identification of host ferns to Dr. L. H. Millener, Department of Botany, Auckland University College, and Miss J. W. Herbert, Department of Botany, University of Queensland.

#### Genus FELISACUS Distant

*Liocoris* Motschoulsky, 1863. Bul. Soc. Imp. des Naturalistes de Moscou 36(2): 86 (pre-occupied by *Liocoris* Fieber, 1858).

*Felisacus* Distant, 1904. Fauna Brit. India, Rhynchota 2(2): 434, 438 (new name for *Liocoris* Motsch.). Poppius, 1912. Acta Societatis Scientiarum Fennicae 41(3): 181-182 (redescription).

*Hyaloscytus* Reuter, 1905. Öfversigt af Finska Vetenskaps-Societetens Förhandlingar 47(5): 1-2.

#### *Felisacus elegantulus* (Reuter)

*Hyaloscytus elegantulus* Reuter, 1905, Öfv. Finska Vetensk.-Soc. Förhandl. 47(5): 2, fig. 1.

*Felisacus elegantulus* (Reuter) auct.

STRUCTURE: Width of head across eyes less than 1.5 times the length (15.75:12; 17:12); interocular space nearly or quite twice as wide as eye (8:4.5; 8:4). Basal 0.25 to 0.33 of head cylindrical, forming a collum separated from rest of head by an annular constriction, in front of which the crown is moderately raised and convex; from constriction, sides convexly diverging to posterior margins of eyes, where head is 0.75 as wide as across eyes; basal collum about 0.8 as wide as head at base of

eyes and nearly 0.66 as wide as across eyes (11:17). Rostrum reaching to middle coxae. Antennae with segment I cylindrical, with long, erect, sparse hairs; II more slender than I, pubescent; III and IV very slender and curved; II about 0.25 longer than I (35:28); III about 1.5 times length of I (43:28); IV about 0.56 the length of I (16:28).

Pronotum in mid-line nearly twice as long as head (23:12); rather more than 0.25 wider across posterior angles than long (30:23), 2.5 times as wide as across anterior collar (30:12), and 0.75 as wide again as head across eyes (30:17); in mid-line, anterior lobe, including collar, shorter than posterior lobe (10:13), the constriction between them coarsely and deeply punctate toward sides, with the two mesial punctures set well forward; posterior lobe strongly raised from constriction, evenly convex from side to side except for shallow sublateral depressions just inside posterior shoulders; lateral margins of shoulders nearly straight, sides of basal lobe of pronotum in front of them markedly sinuate; base broadly and only moderately emarginate in front of scutellum, exposing more or less of mesoscutum, outside scutellum shallowly sinuate. Scutellum with disc nearly flat, smooth, with long, erect, pale hairs; sides incised and then expanded before apex, which is acute and depressed; scuto-scutellar punctures deep, ovoid, oblique.

Hemelytra about twice as long as abdomen; costal margins of corium nearly straight and parallel in closed position, slightly incurved apically, more than twice as long as total width of pronotum (58:24; 51:22) and about three times as long as cuneus; outer margin of inner division of clavus thickened and raised, with a row of long, pale, erect hairs.

Male genitalia as in Fig. 4a, b.

*Length:* Female, 4.2–4.7 mm. Male, 4.0–4.3 mm.

*Width across hemelytra:* Female, 1.1 mm. Male, 1.0 mm.

*COLOUR:* Head and pronotum shining, yellowish brown, sometimes tinged with green.

Often two more or less distinct red marks above inner margins of antennal bases, sometimes also a red mark on groove at base of tylus and on each side of head, particularly on basal collum. Eyes dark brown or reddish brown. Rostrum light brown; labrum black. Antennae dark brown; first segment shining, lighter brown or mahogany; first and second segments pale at extreme base; antenniferous tubercles pale. Posterior shoulders of pronotum dark brown to black. Scutellum uniformly pale yellowish or greenish brown, except for the narrowly dark lateral margins. Hemelytra highly translucent, colourless, except for embolium, which is semiopaque, usually pale green in life; veins strong, brown or greenish brown; margins of embolium and of inner division of clavus and inner margin of corium between clavus and membrane brown to black; corium, clavus, and cuneus glassy, extremely finely and shallowly punctate; membrane very finely and irregularly rugulose, clear, iridescent, with margins narrowly infuscated. Hind wings colourless; veins wide, pale amber, sometimes tinged with pale green. Legs yellowish brown, paler ventrally and on coxae and basal part of femora, which are often light green; tarsi infuscated. Abdomen usually green in life, fading after death to pale yellowish brown.

A colour form exists differing in the following respects from the above description: The red coloration is much more developed; red marks above antennal bases fused as a complete transverse band, red mark on frontal depression very pronounced, red lines on sides of head longer and more definite, extending from eye to pronotum; eyes and first segment and apex of second segment of antennae markedly reddish; dorsal surface of femora and tibiae red; prothoracic shoulders not or scarcely infuscated. Of the specimens examined, 10 of the 26 females and 23 of the 28 males from New Zealand are of this colour form, and one of the ten males and one of the six females from Australia. Both colour forms have been captured together in the

same area. An occasional specimen with well-developed red markings has also heavily infuscated pronotal shoulders.

NYMPH: (Late instar—probably fifth—captured with adults at Puketona, N. Z.) Colour of dried specimen brown, with well-developed red markings as in the second colour form described above. Length, exclusive of anal tube, 2.2 mm.; length of anal tube, 0.37 mm. Head shorter than in adult, vertical in front between antennae. Eyes dark brown, almost touching pronotum. Width of vertex between eyes, 0.2 mm.; width including eyes, 0.45 mm. Legs and antennae long and slender. Length of antennal segment I, 0.8 mm., II, 0.95 mm., III, 1.3 mm.; segment II more slender than I, and III and IV than II. Pronotum with a median groove, sides gradually and smoothly curved, widening posteriorly. Hemelytra extending about midway along abdomen. Anal tube very long, slender, cylindrical, base red, apex pale.

SPECIMENS EXAMINED: New Zealand: 5 females, 2 males, 1 nymph, swept from low ferns (*Pteris tremula* R. Br.) in damp, shaded locality near stream, Puketona, North Auckland, February 12, 1949; 2 females, 1 male, from low ferns at Paihia, Bay of Islands, North Auckland, February 13, 1949; 22 males, 18 females, 29 nymphs, swept from low ferns (*Pteris tremula* R. Br.) in shaded locality beside stream, Whirikino, near Foxton, Manawatu (Wellington Province), January 27, 1951; T. E. Woodward. Three males, 1 female, on fern, Nelson, April 27, 1950, E. S. Gourlay. Australia: 1 male, Illawarra, New South Wales (Macleay Collection). One female, Brisbane, June 3, 1932; 2 females, 1 male (no data, but almost certainly from neighbourhood of Brisbane); Dept. of Entomology Coll., University of Queensland. Eight males, 2 females, 1 nymph, swept from low ferns (*Hypolepis muelleri* Wakefield) in shaded locality beside stream, Dunwich, Stradbroke I., Moreton Bay, Queensland, June 2, 1951, T. E. Woodward. One female, Brisbane, March 29, 1952, J. M. Letchford.

*F. elegantulus* was described from Victoria, Australia. The present records considerably extend its known distribution, north to New South Wales and Queensland and east to both the North and the South Islands of New Zealand.

#### *Felisacus filicicola* (Kirkaldy)

*Hyaloscytus elegantulus* Reuter, var. *filicicola* Kirkaldy, 1908. Proc. Linn. Soc. N.S.W. (2) 33(2): 376-377.

*Felisacus filicicola* (Kirkaldy) Knight, 1935. Ins. Samoa 2(5): 200.

STRUCTURE: Head width across eyes nearly 1.5 times the length (17.5:12); interocular space nearly twice as wide as eye (8.5:4.5). Basal 0.17 of head cylindrical, forming a collum separated from rest of head by a sharp annular constriction, in front of which the crown is moderately raised and convex; from constriction, sides convexly diverging to posterior margins of eyes, where head is rather less than 0.75 as wide as across eyes (12:17.5); basal collum about 0.83 the width of head at base of eyes (10:12) and over 0.5 the width across eyes (10:17.5). Rostrum reaching to middle coxae. Antennae with segment I cylindrical, with long, erect, sparse hairs; II more slender than I, pubescent; III and IV very slender, curved; length of I:II::28:35.

Pronotum in median line over 1.5 times length of head (21:12); about 0.25 wider across posterior angles than long (26:21), about 2.3 times as wide as across anterior collar (26:11), and 1.5 times as wide as head across eyes (26:17.5); in mid-line, anterior lobe, including collar, shorter than posterior lobe (9.5:11.5), the constriction between them coarsely and deeply punctate toward sides, with the two middle punctures set well forward; posterior lobe strongly raised from constriction; both lobes evenly convex from side to side except for sublateral depressions inside posterior shoulders; shoulders with lateral margins nearly straight, sides of pronotum sinuate in front of them; base distinctly and roundly

emarginate in front of scutellum, widely exposing mesoscutum. Scutellum moderately raised, disc nearly flat, smooth, with sparse, longish, erect pale hairs, apex declivous, sides incised just before apex; two deep transverse punctures on scuto-scutellar suture.

Hemelytra long; costal margins of corium nearly straight and parallel, rather more than twice as long as total length of pronotum (50:23); outer margin of cuneus rather more than 0.33 as long as corium (17.5:50); outer margin of inner division of clavus raised and thickened, with a row of long erect hairs.

The male genitalia are described by Usinger, 1946: 69.

*Length:* Female, 4.2 mm. Width across hemelytra, 1 mm.

*COLOUR:* Shining above; head, venter, pronotum, and first segment of antennae fulvous; second antennal segment dark reddish brown. Eyes dark brown. Scutellum fulvous brown. Margins of inner division of clavus brown. Embolium semiopaque, yellowish brown, reddish brown at apex, inner and outer margins narrowly black. Corium with a fuscous band alongside apical third of margin of clavus. Apical margin of corium as far as cuneus dark brown. Rest of corium clear, transparent. Cuneus reddish brown. Membrane clear except for very narrowly dark margins and fuscous brown vein; iridescent and finely and irregularly rugulose. Coxae, trochanters, and base of femora yellow; tarsi fuscous; rest of legs shining brown.

This species displays a rather similar colour variation to that seen in *elegantulus*. Kirkaldy (1908) states that "the colouring of the body is somewhat variable, being often suffused with red; the pronotum may be immaculate, or the postero-lateral angles may be more or less widely fuscous."

*SPECIMENS EXAMINED:* 1 male (damaged), 1 female, Kadavu, Fiji Is., July 25, 1938, R. A. Lever.

*F. filicicola* is very close to *F. elegantulus* (Reuter), but differs in its darker colour (head and pronotum fulvous, scutellum fuscous,

cuneus reddish brown), the pronotum in median line shorter relative to head, with base more deeply excavated, less expanded, and narrower in proportion to length, to anterior width, and to width of head across eyes.

*Felisacus amboinae* n. sp.

Figs. 1, 2

*STRUCTURE:* Head across eyes nearly 1.5 times the length (16:11); interocular space just over 1.5 times as wide as eye (7:4.5). Eyes large, as seen from above rather longer than postocular part of head (6:5). Basal 0.2 of head cylindrical, forming a collum separated from rest of head by a sharp annular constriction, in front of which the upper surface is strongly raised and convex; from constriction, sides convexly diverging to posterior margins of eyes, where head is 0.75 as wide as across eyes (13:17.5); basal collum about 0.75 as wide as head behind eyes (0.75–0.79) and over 0.5 as wide as across eyes (9.25:16, 10:17.5). Rostrum reaching to middle coxae. Antennae with segment I cylindrical, with long, erect, sparse hairs; II more slender than I, pubescent; III and IV very slender and curved; length of I:II::26:32.

Pronotum with median length over 1.5 times that of head (male, 19:11; female, 22:13); 0.16 to 0.2 wider across posterior angles than long (male, 23:19; female, 26:22) and about 2.33 times as wide as across anterior collar (male, 23:10; female, 26:11.5); in mid-line, anterior lobe, including collar, equal or very nearly equal in length to posterior lobe, the constriction between them coarsely and deeply punctate toward sides, with the two middle punctures set well forward; posterior lobe strongly raised from constriction; both lobes evenly convex from side to side except for sublateral depressions inside posterior shoulders; shoulders with lateral margins nearly straight, sides of pronotum moderately sinuate in front of them; base distinctly emarginate in front of scutellum, somewhat angularly concave in middle, widely exposing mesoscutum. Scutellum moder-



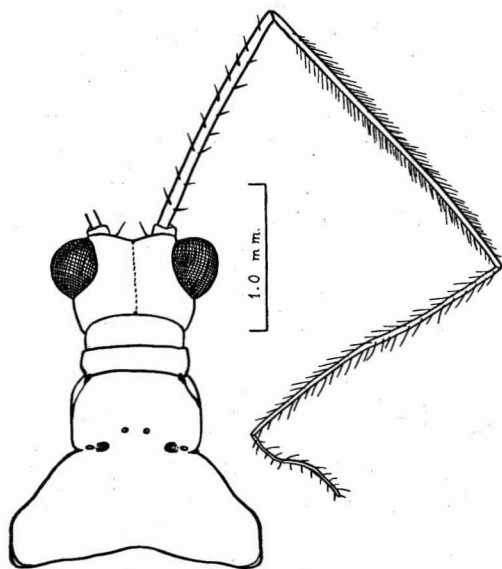


FIG. 1. *Felisacus amboinae* n. sp. Head and pronotum.

ately raised, smooth, with sparse, longish, erect pale hairs; two deep punctures on scuto-scutellar suture.

Hemelytra long; costal margins of corium nearly straight and parallel, slightly over twice as long as total length of pronotum (48:23); outer margin of cuneus rather less than 0.33 as long as corium (14:45, 15:48). Outer margin of inner division of clavus raised and thickened, with a row of long, pale, erect hairs.

*Length:* 3.75 mm. Width across hemelytra: Male, 0.8 mm.; female, 0.95 mm.

*COLOUR:* Shining above. Head, pronotum, and scutellum yellowish brown. Head with red markings anteriorly, along inner margins of eyes, and narrowly in mid-line. Eyes reddish brown or reddish black. Antennae with segment I red or reddish brown, II red or reddish black, III and IV black. Rostrum yellowish brown. Sides of anterior division of pronotum sometimes red. Base of pronotum inside posterolateral angles more or less infuscated. Swollen outer part of anterior lobe of scent-gland spout red. Legs yellow; apex of femora and base of tibiae red, the red colouring sometimes extending along entire

upper surface or even whole of tibiae and as a narrower dorsal line on femora; tarsi infuscated at apex. Whole of cuneus coloured, orange or orange-red, with inner margin usually widely and costal margin more narrowly red. Embolium red at apex and narrowly red or reddish brown along costal and inner margins. Inner half of clavus red, at least on margins; outer half translucent, pale. Inner margin of corium along apex of clavus more or less widely dark brown or black. Apical margin of corium as far as cuneus red, with adjacent area more or less infuscated. Membrane with margins narrowly infuscated; veins testaceous, more or less tinged with red. Rest of hemelytra clear hyaline. Veins of hind wings brown. Ventral surface of body yellowish brown. Dorsal surface of abdomen red.

*TYPES:* Holotype male, allotype female, 1 paratype male, Amboina (E. Indies), F. Muir. Deposited in the California Academy of Sciences.

This is the species noted by Usinger (1946: 70).

*F. amboinae* belongs to the *elegantulus* group of species (see below) and is perhaps most closely related to *ochraceus* Usinger, from Guam. It is distinguished from the latter, however, by marked differences in colour, by the less protuberant eyes, by the basal emargination of the pronotum being less widely rounded and more angulated in the middle, and by the proportionately somewhat shorter cuneus. It differs from *filicicola* (Kirkaldy) in colour, the smaller size, the eye wider in proportion to interocular space, the head

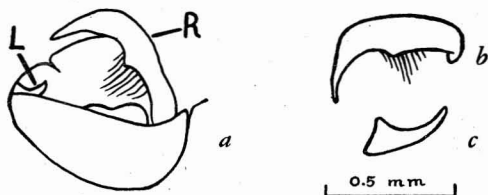


FIG. 2. *Felisacus amboinae* n. sp. a, Apex of male abdomen, posterior aspect (R, right clasper; L, left clasper); b, right clasper, posteroventral aspect; c, left clasper, lateral aspect.

across eyes narrower in proportion to width immediately behind eyes, where head is rather more expanded and wider also in proportion to basal collum, the posterior lobe of pronotum relatively somewhat shorter in mid-line and wider at base, and the cuneus proportionately rather shorter. From *elegantulus* (Reuter) it differs in colour, the smaller size, the eye wider in proportion to interocular space, basal collum of head narrower in proportion to width both behind eyes and across eyes, pronotum somewhat shorter in mid-line relative to head, with base proportionately wider. From *nigricornis* Poppius (not seen) it differs in colour and the relatively shorter pronotum and first antennal segment, and from *jacobsoni* Poppius (not seen) in colour, the smaller size, the relatively shorter hemelytra and first antennal segment, the pronotum shorter, more declivous, and less narrowed from base to apex.

*Felisacus usingeri* n. sp.

Fig. 3

STRUCTURE: Head long and narrow, scarcely wider across eyes than long (14:13); as seen from above, not concave in front, anterior margin between antenniferous tubercles nearly straight, slightly convex, about 0.25 width across eyes (3.5:14); 0.4 as wide again across eyes as immediately behind eyes (10:14), thence gradually and slightly narrowed to base of head, where 0.9 as wide as behind eyes; no collum or annular subbasal constriction; crown with a transverse depression behind and between eyes, scarcely extending beyond level of their inner margins; seen from above, postocular part of head distinctly longer at sides than length of eye (7:5), with sides nearly straight, slightly sinuate behind middle. Eyes moderate, each over half as wide as interocular space (3.75:6.5). Seen from the side, eye equal in height to length of the vertical, apical (subocular) part of head from ventral margin of eye to base of rostrum (7:7). Antenniferous tubercles short, scarcely projecting beyond apex of head. Rostrum reach-

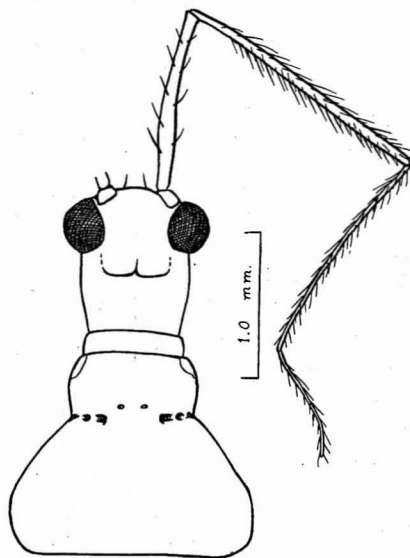


FIG. 3. *Felisacus usingeri* n. sp. Head and pronotum.

ing middle coxae; relative lengths of segments I-IV, 5.5:11:16. Antennae shorter than body (85:110); segment I shorter than pronotum (18:22.5), about 0.25 longer than width of head (18:14), moderately swollen at basal third and tapering to just before apex, widening slightly at extreme apex; segment II slender, cylindrical; III and IV extremely slender, curved; I with sparse, erect, pale hairs, other segments pubescent; proportionate length, I-IV, 18:27:26:14.

Pronotum about 0.75 as long again as head (22.5:13); collar short, about 0.09 total length of pronotum; posterior lobe half as long again as anterior lobe, including collar (13.5:9); the constriction between them deeply punctate, the two mesial punctures set distinctly forward; posterior lobe strongly convex, considerably raised above constriction, more shortly declivous toward base; base nearly straight, only very feebly emarginate before base of scutellum; over twice as wide across posterior shoulders as across collar (24.5:10.5) and rather wider than total length (24.5:22.5); sides of posterior lobe in front of shoulders straight, evenly converging toward constriction. Scutellum rather strongly raised, with

sparse, erect, pale hairs; smooth except for two large punctures on basal margin.

Hemelytra long; the costal margin of corium feebly arcuate, especially posteriorly, less than twice as long as pronotum (42:22.5); the cuneus more than 0.33 as long as corium (17.5:42).

*Length:* Female, 3.8 mm. Width across hemelytra, 0.9 mm.

*COLOUR:* Head, pronotum, and scutellum shining, pale yellowish brown. Eyes reddish brown. First antennal segment yellowish brown; second segment and apex of first dark reddish brown; third and fourth black. Clavus pale amber, margins of inner division darker yellowish brown. Embolium slightly tinged with amber; yellow at apex; margins, especially at apex, very narrowly brown. Inner margin of corium, from just in front of apex of clavus to inner basal angle of cuneus, infuscated brown; rest of corium colourless. Cuneus nearly colourless, faintly tinged with amber; outer margins narrowly dark. Membrane colourless; veins pale. Rostrum, tibiae, apex of femora, undersurface of head and thorax pale yellowish brown. Tarsi infuscated at apex. Remaining segments of legs and venter of abdomen yellowish white.

*TYPE:* Holotype female, Los Banos (Luzon, Philippine Is.), July 17, 1936, R. L. Usinger. Deposited in the California Academy of Sciences.

This species was noted by Usinger (1946: 72).

*F. usingeri* belongs to the *magnificus* group of species and appears to be closest to *philippinensis* Hsiao, differing in the paler colour; the rather smaller size; the narrower head across eyes in proportion to length of head, width behind eyes, and width of pronotal base; the much shorter second and third antennal segments; and the longer rostral segments I-III (4:4:8 in *philippinensis*). *Usingeri* resembles *magnificus* Distant in the long, narrow head; from this species, however, it differs strikingly in colour, the pattern being very characteristic in *magnificus*, in the shorter an-

tenniferous tubercles and the more convex and much narrower anterior border of the head between them (in *magnificus*, interantennal width: width across eyes::4.5:15), in the three basal segments of the rostrum being longer in proportion to the fourth (in *magnificus*, 3:3:8.5:18), height of eye equal to subocular part of head (much greater in *magnificus*, 8:5), the proportionately shorter first antennal segment (in *magnificus*, I:II::22:25), the posterior lobe of pronotum narrower at base in proportion to anterior collar (in *magnificus*, 27:10.5).

From *crassicornis* Usinger the new species differs in its paler colour, in the much longer and narrower head, the eyes wider in proportion to interocular space, the proportionately longer second antennal segment, the pronotum longer in proportion to head, with apical collar proportionately shorter, the cuneus longer in proportion to corium. From *pulchellus* Poppius (not seen) it differs markedly in colour, the wider eyes in proportion to interocular space, and the relatively much longer second antennal segment; and from *longiceps* Poppius (not seen) in colour and in the relatively much shorter first and fourth antennal segments.

The measurements and figures of *magnificus* given in this paper are derived from a specimen collected in Amboina, E. Indies (F. Muir, June, 1908), and kindly supplied to me by Dr. R. L. Usinger, who had provisionally identified it as *magnificus*. This species was described from Tenasserim (Distant, 1904: 439, fig. 284). Topotypic material has not been available, so that no further comparison has been possible. However, the appearance of *magnificus* is strikingly characteristic, and the present specimen agrees with Distant's figure and with his description as far as it goes. In view of the presence of *elegantulus* in both Australia and New Zealand, the occurrence of *magnificus* so far from its type locality does not seem so surprising. Little is known of the extent and methods of distribution of the species of this genus. It



would be interesting to test the possibility of the eggs being inserted into and transported in fern stems (e.g., among packing material).

#### SPECIES GROUPS OF FELISACUS

The species of *Felisacus* fall into at least two and possibly three groups.

To the *magnificus* group belong *magnificus* Distant, 1904 (Tenasserim, Burma, and Amboina, E. Indies), *pulchellus* Poppius, 1915b (Philippine Is.), *longiceps* Poppius, 1915b (Formosa), *philippinensis* Hsiao, 1944 (Philippine Is.), *crassicornis* Usinger, 1946 (Guam), and *usingeri* n. sp. (Philippine Is.). This group is characterised by the subbasally swollen first antennal segment, by the nearly straight, scarcely emarginate base of the pronotum, and by the neck-like postocular part of the head gradually narrowing to the base, without a cylindrical basal collum sharply and completely constricted from a wider region behind the eyes. In *magnificus*, *philippinensis*, and *crassicornis*, at least, the right clasper of the male has the form of a curved rod, slender throughout its length, not considerably widened and flattened basally; the left clasper is nearly straight and only feebly curved on its outer margin; the right clasper is slightly knobbed or spatulate at apex, and either the right or the left clasper, or both, may give off a shorter or longer internal branch; ventral margin of apex of abdomen narrowly convex between right and left claspers (Fig. 4). It is desirable that the other species should be examined to determine whether the male genitalia and any other structures can be used as group characters.

In the *elegantulus* group are included *elegantulus* (Reuter, 1905) (Australia and New Zealand), *filiicola* (Kirkaldy, 1908) (Fiji and Samoa), *nigricornis* Poppius, 1912a (New Guinea), *jacobsoni* Poppius, 1914 (Java), *ochraceus* Usinger, 1946 (Guam), and *amboinae* n. sp. (Amboina, E. Indies). The features of this group are the cylindrical first antennal segment, not swollen subbasally, the distinctly excavated base of the pronotum, and the

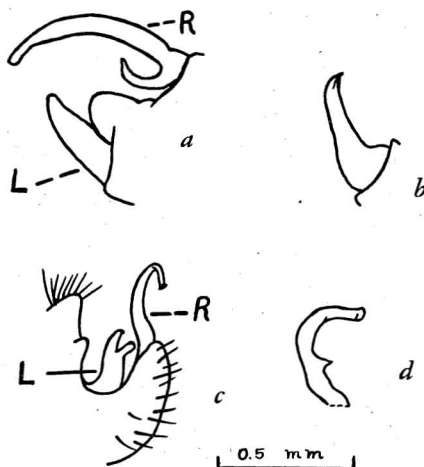


FIG. 4. Male genitalia, *magnificus* group (R, right clasper; L, left clasper). *Felisacus magnificus* Distant: a, Apex of abdomen (posteroventral); b, left clasper (posterior). *Felisacus philippinensis* Hsiao: c, Apex of abdomen (posterolateral); d, right clasper (ventrolateral).

differentiation of the base of the head as a cylindrical collum sharply and completely constricted from a wider region just behind the eyes. In *elegantulus*, *filiicola*, *ochraceus*, and *amboinae*, at least, the right clasper of the male is considerably widened and flattened basally and narrowed and curved apically, the inner margin with a more or less pronounced subbasal expansion; the left clasper is strongly curved upward and inward, with its outer margin strongly convex; ventral margin of apex of abdomen widely convex between right and left claspers. (See Figs. 2, 5.)

It seems possible that some or all of the following species might form a third group: *glabratus* (Motschoulsky, 1863) (Ceylon, Java, Philippine Is.), *auritulus* Distant, 1913 (Seychelles), *carpenterae* Hsiao, 1944 (Singapore and Borneo), and perhaps also *madagascariensis* Poppius, 1912b (Madagascar). From the descriptions, these would seem to present a different combination of characters from that shown by either of the other two groups, but none of these species has been examined in the present study.

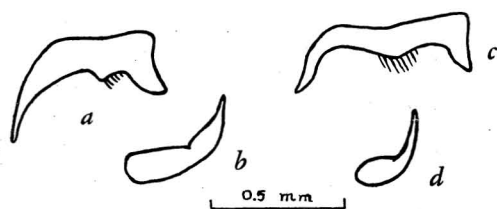


FIG. 5. Male claspers, *elegantulus* group. *Felisacus elegantulus* (Reuter): a, Right clasper (posteroventral); b, left clasper (lateral). *Felisacus ochraceus* Usinger: c, Right clasper (posteroventral); d, left clasper (lateral).

If critical study of a more complete series of species should uphold this or a similar division of the genus, it might be found advantageous to regard the groups as subgenera. In this case, provided *elegantulus* did not prove to fall into the same group as *glabratus*, *Hyaloscytus* Reuter, 1905, could be retained as a subgeneric name for the *elegantulus* group.

Each of the groups as tentatively designated above centres on a more or less distinct geographical range, with a number of aberrancies to be expected as the result of dispersal from the centre of origin. The first group is mainly northern Pacific, the second mainly southern Pacific, and the third more or less fringing the Indian Ocean.

It seems to the author not unlikely that some of the described species of *Felisacus* might eventually have to be considered as subspecies. For example, *filicicola* is very close to *elegantulus* and might have developed as a geographical race of the latter, whereas *usingeri* is close to *philippinensis*, and the former might perhaps prove to be a lowland race and the latter a high-altitude race of the one bitypic species. However, at present there are no criteria by which specific and sub-

specific limits in this genus might be satisfactorily demonstrated; until more complete evidence is available on extent of variation, distribution, biology, and interbreeding, and the structure of the male genitalia, it seems desirable to maintain specific status for all forms which are readily distinguishable on the basis of correlated structural differences.

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